

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventors: Joachim LOHR, et al.

Appln. No.: National Phase of PCT/EP2006/002971

Filed: August 17, 2006

For: HAPPY BIT SETTING IN A MOBILE COMMUNICATION SYSTEM

PETITION TO MAKE SPECIAL

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

The Applicants respectfully petition that the above-captioned application be granted special status. The requirements of MPEP section 708.02(VIII) are complied with as follows:

(1) The petition fee set forth in 37 CFR 1.17(i) is authorized to be charged to Deposit Account No. 19-4375.

(2) All pending claims (claims 1-15, 17, 18, and 20-25) of the present application are believed to be directed to a single invention; if the Office determines that all the claims presented are not obviously directed to a single invention, the Applicants

agree to make an election without traverse as a prerequisite to the grant of special status.

(3) A pre-examination search has been made in the form of a search report in a counterpart PCT International Application (International Search Report (ISR) dated July 13, 2006). Under MPEP 708.02, VIII, a search made by a foreign patent office satisfies the search requirement.

Also, a pre-examination search has been made, and the field of search is:

Class 370, subclasses 329, 335, 341 and 342; and
Class 455, subclasses 452.1, 452.2 and 522.

Examiners Steven Nguyen and Brenda Pham were consulted for the above field of search.

An Information Disclosure Statement directed to the references cited in the ISR and located during the pre-examination search is filed concurrently herewith.

(4) One copy each of the prior art deemed most closely related to the subject matter encompassed by the claims is of record in the form of the art cited in the Information Disclosure Statement filed herewith.

(5) The following is a detailed discussion of the art of record, and comments pointing out how the instant claimed subject matter is patentably distinguishable thereover.

A. Discussion of All References of Record

3GPP TR 25.401, "UTRAN Overall Description" discussed at application page 4, third full paragraph, discloses the high level R99/4/5 architecture of Universal Mobile Telecommunication System (UMTS), as shown in application Fig. 1.

3GPP TR 25.896, "Feasibility Study for Enhanced Uplink for UTRA FDD (Release 6)" discussed at application page 6, second full paragraph, discusses uplink enhancements for Dedicated Transport Channels (DTCH).

3GPP TSG RAN WG1, meeting #31, Tdoc R01-030284, "Scheduled and Autonomous Mode Operation for the Enhanced Uplink" discussed at application page 7, second full paragraph, et seq., describes a new MAC sub-layer called MAC-e.

3GPP TS 25.309 version 6.2.0 Release 6, "Universal Mobile Telecommunications System (UMTS); FDD enhanced uplink," cited under Category X in the ISR, describes transport format combination selection for the enhanced dedicated channel (E-DCH), according to the scheduling information received from UTRAN and for arbitration among different flows mapped on the E-DCH. In the DL, a resource indication (Scheduling Grant) is required to indicate to the UE the maximum amount of UL resources the UE may use. When scheduling grants, the Node B may use quality of service-related information provided by the serving radio network

controller and from the UE in scheduling requests. Scheduling grants control the maximum allowed E-DPDCH/DPCCH power ratio. Absolute grants provide an absolute limitation of the maximum amount of UL resources the UE may use, and the relative grants increase or decrease the resource limitation compared to the previously used value. If the UE has data to transmit and the serving grant is below the maximum serving grant, the serving grant is increased over time by configurable steps (autonomous ramp-up) until the serving grant is equal to maximum serving grant. For the UE to request resources from the Node B(s), scheduling requests are transmitted in the UL in the form of scheduling information and a happy bit. The happy bit is set to "unhappy" if the UE has power available to send at higher data rates and total buffer status would require more than X transmission timing intervals (TTIs) with the current grants. Otherwise, the happy bit is set to "happy."

US 2004/082356, cited under Category X in the ISR, discloses a system for transmitting data in a wireless multiple-access multiple-input multiple-output (MIMO) communication system. The system employs a reverse channel (RCH) request field that is used by the user terminal to request additional capacity on the uplink so that the user terminal can send additional data.

US 2004/252661, cited under Category X in the ISR,

discloses a method and an apparatus for increasing the flexibility of uplink resource allocation for a mobile station (MS). The document discloses a technique for modifying the resource allocation on the fly when data from different Radio Bearers are multiplexed through the same uplink resources (temporary flow identities (TFIs) that share the same uplink state flag (USF)) through the use of an existing or a new access type to request additional resources.

3GPP TSG-RAN WG2 Meeting #48bis, "R2-052358 Criteria for the Happy Bit," cited under Category L in the ISR, proposes setting of the happy bit to "unhappy" only if it has enough power to transmit with enhanced transport format combination where one more service data unit fits and if the scheduling grant is fully used. The reason for this proposal is that otherwise the UE does not tell the Node B whether the UE can actually transmit more data if it is granted more resources.

3GPP TSG-RAN WG2 Meeting #46, "R2-050349 Happy Bit with Mirroring," cited under Category A in the ISR, proposes simultaneous usage of the happy bit and the enhanced transport format indicator value and incorporating a mirror function into the happy bit to enable the Node B scheduler to distinguish the reason why the UE has power headroom. This document proposes modifying the usage of the happy bit by indicating that the UE is

not happy only if the UE has power available to send at higher data rates than the scheduled grant, no down command exists from a non-serving cell, and total buffer status would require more than X transmission timing intervals (TTIs) with the current grant.

US 2006/0120404 discloses a technique for enhancing the uplink dedicated channel (E-DCH) for packet data traffic. The technique uses a control parameter that defines the minimum time interval between subsequent new transmissions. A happy bit is transmitted in the UL. The UTRAN can increase the transmission interval for specific services (e.g. voice over Internet protocol (VoIP)) in the UTRAN in order to increase transmission capacity.

US 2005/0239413 discloses a system wherein a base station broadcasts to a mobile terminal downlink signals including a maximum resource indicator and a minimum resource indicator. In response to these signals, the mobile terminal limits the utilization of a resource such as bit rate, transmission power or power offset which is a function of power that is distributed between a data channel and a control channel. The mobile terminal may send an uplink signal including a resource request to the base station. In response, the base station may change the downlink signals based upon other factors.

B. Discussion of How the Claimed Invention Patentably Distinguishes over the References of Record

It is submitted that the references cited above, considered either alone or in combination, fail to disclose or suggest at least the following subject matter:

(1) a mobile terminal transmits control information which comprises a resource request flag that, when set, requests a base station to increase uplink resources for uplink data transmissions via an uplink dedicated channel, wherein the mobile terminal does set the resource request flag, if the mobile terminal transmits uplink data via the dedicated uplink channel utilizing the maximum amount of uplink resources set by a scheduling grant (independent claims 1 and 13).

(2) a mobile terminal transmits control information which comprises a resource request flag that, when set, requests the base station to increase uplink resources for uplink data transmissions via an uplink dedicated channel, wherein the mobile terminal does not set the resource request flag, if the mobile terminal transmits uplink data via the dedicated uplink channel without utilizing the maximum amount of uplink resources set by a scheduling grant or the mobile terminal is in a process of

step-wise increasing the amount of uplink resources utilized for uplink data transmissions (independent claims 2 and 14).

(3) a computer readable medium storing instructions that, when executed by a processor of a mobile terminal, cause the mobile terminal to communicate resource requests for dedicated uplink channel resources in a mobile communication system, by the operations of (1) above (independent claim 17).

(4) a computer readable medium storing instructions that, when executed by a processor of a mobile terminal, cause the mobile terminal to communicate resource requests for dedicated uplink channel resources in a mobile communication system, by the operations of (2) above (independent claim 18).

While the above references teach general techniques relating to happy bits and requests for additional uplink capacity, they do not teach or suggest the present claimed invention. More particularly, US 2004/082356 and US 2004/252661 disclose techniques for a mobile terminal to request additional capacity on the uplink. The 3GPP TS 25.309, 3GPP R2-050349 and 3GPP R2-052358 documents together teach use of a happy bit to indicate that the UE is not happy only if the UE has power available to send at higher data rates than a scheduled grant, no down command exists from a non-serving cell, and total buffer status would require more than X transmission timing intervals (TTIs) with the

current grant. However, the references of record, taken alone or together, fail to teach or suggest setting the resource request flag, if the mobile terminal transmits uplink data via the dedicated uplink channel utilizing the maximum amount of uplink resources set by a scheduling grant or not setting the resource request flag, if the mobile terminal transmits uplink data via the dedicated uplink channel without utilizing the maximum amount of uplink resources set by a scheduling grant or the mobile terminal is in a process of step-wise increasing the amount of uplink resources utilized for uplink data transmissions. Nor do the references, alone or together, teach or suggest a computer readable medium storing instructions that, when executed by a processor of a mobile terminal, cause the mobile terminal to communicate resource requests for dedicated uplink channel resources in a mobile communication system, by such operations.

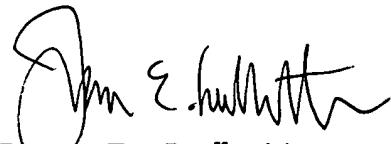
Thus, the Applicants submit that the above-noted combinations of features of the independent claims are not taught or suggested by the combined teachings of the art of record, and thus the independent claims, and all claims dependent therefrom, are patentable.

Accordingly, in light of the foregoing discussion pointing out how the claimed invention distinguishes over the cited references, the Applicants respectfully submit that the

inventions of all the presently pending claims are not anticipated by these references and would not have been obvious over any combination thereof.

Grant of special status in accordance with this petition is respectfully requested.

Respectfully submitted,



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James E. Ledbetter
Registration No. 28,732

JEL/att

ATTORNEY DOCKET NO. L7725.06120

STEVENS, DAVIS, MILLER & MOSHER, L.L.P.

1615 L STREET, NW, Suite 850

WASHINGTON, DC 20043-4387

Telephone: (202) 785-0100

Faxsimile: (202) 408-5200